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OF MILITARY PERFORMANCE AT A
LARGE ANTARCTIC STATION

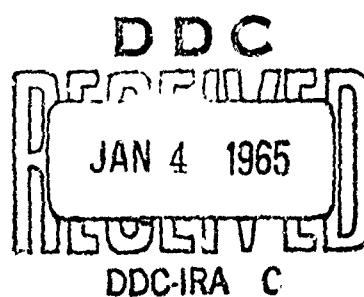
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Personal History Correlates of Military
Performance at a Large Antarctic Station

by

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Abstract

Relationships between biographical predictors and superiors' ratings were examined for two samples of Navy men who wintered-over at a large Antarctic base. Results for the large station personnel were very similar to those for Navy men studied earlier at smaller stations with respect to the favorability of an age-experience-rank cluster of variables and the unfavorability of past delinquency-truancy record. For a cluster of variables pertaining to needs for avocational activities, however, validity indicators tended in opposite directions for the two populations, low avocational activity being related to better adjustment at small stations. These findings demonstrated significant effects of environmental and organizational factors upon the validity of particular biographical predictors.

In earlier studies (Nelson & Gunderson, 1963; Nelson & Orwick, 1964), the authors evaluated biographical attributes as predictors of performance among Navy and civilian personnel who participated in the United States research programs at smaller Antarctic stations (15 to 35 men). Because of wide differences on a number of social background variables and in task assignments, analyses were conducted separately for the military and civilian groups.

A variety of items from a biographical questionnaire were related to criterion measures derived from supervisor and peer ratings made at the stations. Principal findings for military personnel were that age and job experience, low need for avocational activity, and absence of delinquent history were positively associated with good performance. Results differed for civilian personnel who were subdivided into weather and science groups. Age and experience were more important for the weather than for the science personnel, while education seemed of greater importance for the latter group. Neither past delinquent conduct nor need for avocational activity were related to performance among civilians in any consistent way. Urban background was related to performance in opposite directions for the two civilian subgroups.

In the present study relationships between biographical data and supervisors' evaluations of performance are analyzed for Navy personnel wintering-over in two successive years at the large, permanent Antarctic station, McMurdo Sound. The work and social environment at this base is quite different from that experienced at the small stations studied earlier. Size (over 200 men), recreational facilities available, and organizational characteristics make it more similar to a typical Navy base (except for the extreme climate and winter isolation) than any of the

smaller wintering-over communities. The organizational structures of large and small stations differed primarily in that typically only one representative of each occupational specialty was included in the complement of the small stations, while several men of varying rank from most of the occupational groups were present at McMurdo, providing a familiar hierarchical pattern of authority relationships. Of major interest to the investigators was the possibility that the predictive validities of the personal history attributes studied previously in small stations would differ significantly in a new and different situation.

Method

Subjects. Samples consisted of Navy men wintering-over at McMurdo Sound, Antarctica, on two successive years. Only those subjects were utilized on whom biographical data and superiors' ratings were available. The N for the first year was 94; for the second year it was 90. The average age, military experience, and formal education were 26 years, 8 years, and 12 years, respectively, for the first sample and 28 years, $9\frac{1}{2}$ years, and $11\frac{1}{2}$ years, respectively, for the second sample.

Procedures. Prior to deployment to the Antarctic, each man filled out an extensive biographical inventory, the Standard Psycho-Diagnostic Record Booklet, from which a limited number of items, considered to be of most importance in summarizing life history events, were selected for study. The original items utilized and the scores subsequently derived from them were described in some detail previously (Nelson & Gunderson, 1963).

Performance data were obtained on each man after completing a year of duty at McMurdo Sound. Both years ratings on a 5-point scale were made independently by the Medical Officer and the Executive Officer of the base. Each rater was provided with a roster of all Navy men at the station and was given the following instructions: Based upon his performance and adjustment over the entire year, evaluate each individual's suitability for the wintering-over assignment at McMurdo, using the rating scale below (1 - Unacceptable, 2 - Inferior, 3 - Average, 4 - Superior, 5 - Outstanding). The Medical Officer and the Executive Officer were believed to be in the best positions to make observations of performance and adjustment among the entire station complement. Ratings from the two independent evaluations were averaged to provide a joint estimate of overall performance. For those cases where only one rating was given, the single rating was used as the performance estimate.

Results

Table 1 provides a comparison of the small station military population previously studied

and the two large station samples on a number of personal history attributes. The two populations were very similar on the age and experience variables. Differences were apparent on certain remaining variables. Large station personnel were more frequently from large urban families than small station personnel. The second large station sample differed from both the first large station sample and the small station sample in Frequency of Worship and in Delinquency-Truancy Record. There is no *a priori* reason to expect these population differences to affect the predictive values of the various personal history attributes for performance.

Table 1
Comparison of Small Station and Large
Station Personnel on Personal History Attributes

<u>Attributes</u>	<u>Small Station</u>	<u>Large Station I</u>	<u>Large Station II</u>
	%	%	%
Over 25 years of age	50	44	53
Over 4 years job experience	70	63	74
Graduated from high school	66	76	76
Presently married	42	26	41
Worship at least monthly	30	24	41
Raised in a town \geq 25,000	23	52	44
Had 3 or more siblings	59	77	86
Activity score ("High")	15	33	26
Reading score ("High")	28	31	23
Delinquency-truancy record	59	59	30
N	64 ^a	94 ^a	90 ^a

^aN's were reduced slightly for some of the variables.

Relationships between biographical data and the performance criterion for the two McMurdo samples are shown in Table 2. In the first sample the age-experience-rank cluster is positively associated with superior performance. The same trends are present in the second sample but only pay grade reaches statistical significance. These results generally replicated the outcome for the previous small station sample. More education, attending worship regularly, and being married tended to have positive values for adjustment at the large station, but the relationships

were not consistent over both years. None of these variables were clearly related to any of the performance criteria for small station military personnel. The Activity Level score in the second sample showed the highest relationship of any variable with the criterion. This finding was of particular interest since a significant relationship in the opposite direction was found for small station military personnel. Amount of reading, urban-rural background, family size, and parents' education were unrelated to performance at a large station. The final variable in Table 2, Delinquency-Truancy, is significantly correlated with the performance criterion on both occasions.

Table 2
Relationships of Biographical Attributes to Performance at a Large Station

<u>Attribute</u>	<u>Correlation with Performance Criterion</u>			
	<u>Sample I</u>		<u>Sample II</u>	
	<u>r</u>	<u>N</u>	<u>r</u>	<u>N</u>
Age	.21 **	94	.16	90
Years service	.20 * *	91	.10	89
Pay grade	.22 **	94	.28 ***	90
Education	.08	87	.21 *	84
Married	.21 **	94	.06	90
Frequency of worship	.12	91	.23 **	90
Activity level	.03	94	.38 ***	90
Amount of reading	.07	94	.15	90
Size of hometown	-.07	91	.00	90
Family size	-.08	91	-.05	90
Parents' Education	-.02	79	.13	70
Delinquency-truancy	-.27 ***	94	-.23 **	90

* p < .10

** p < .05

*** p < .01

Discussion

Earlier studies demonstrated that the same biographical attributes differed in effectiveness

ness as predictors of performance among three occupational subgroups at small Antarctic stations. In the present study the possible effects of situational differences upon predictive validities were explored. Relationships of biographical data to superiors' ratings for Navy personnel assigned to a large Antarctic base were compared with those for Navy personnel serving at small stations. The large station was a more open and normal society for Navy men than the smaller stations which were characterized by close, confined living, very limited recreational facilities, and an egalitarian social structure. It seemed plausible that intense or idiosyncratic personal needs and behaviors might have different consequences in these different types of isolated communities.

For large station personnel two biographical attributes, rank or pay grade attained, which provided evidence of positive past achievements, and delinquency-truancy record, which provided evidence of past nonconformity or maladjustment, were consistent predictors of performance. These results agreed generally with those for small station personnel and left little doubt that military experience was consistently predictive of satisfactory performance in the Antarctic setting, regardless of station size. Another cluster of variables which pertained to participation in avocational activities, such as clubs, hobbies, and sports was strikingly different in its relationship to performance in the two settings. At small stations, where opportunities for avocational activities were severely restricted, strong preferences for such activities were negatively correlated with adjustment. At the large station, where recreational and social activities were more varied and more consistently available, expressed need for avocational activities was substantially positively correlated with the criterion in one sample and negligibly correlated with it in the other. Preferences for attending worship and reading frequently also tended to be positively related to the criterion at the large station which, again, ran counter to trends at the small stations.

The differences in direction of predictive validities observed in the two settings for this important cluster of biographical items, manifestly related to potentialities for boredom or good morale, have obvious theoretical implications with respect to the relationship of certain personal need patterns to adjustment in unusual and restricted environmental settings. The finding also would appear to have potential practical value for aiding in placement of personnel in the Antarctic.

The performance criterion used in the present study, while not the same in detail as those used in the small station studies, were similarly based upon independent ratings by superiors. Such global ratings, of course, depend substantially upon subjective judgment and thus are

suspect as adequate measures of general performance. However, in the present case the raters were well informed about the objectives of the organization and the job behaviors of most individuals; judgments were based upon a long, continuous period of observation (one year) and were pooled to reduce subjective bias. Inter-rater agreement (average $r = .50$) was equal to that achieved at the Antarctic small stations where much closer personal observation was possible.

In this study no attempt was made to evaluate the maximum efficiency of prediction possible in this setting with all available predictors, including attitude inventory scores and clinicians' ratings. The validities of the biographical information alone would appear less than gratifying for selection. The feasibility of developing reasonably efficient test batteries to predict performance in varied and unusual environmental settings will be considered in a future report.

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